

***Detailed Action***

This Action is responsive to the Amendments received on 5/12/2008.

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney Mark Wilson on July 25th, 2008.

The authorized amendments are stated below:

(1) Replace claim 1 with the following:

**--- A Phase Locked Loop comprising a frequency detector including a balanced quadricorrelator, the balanced quadricorrelator comprising:**

**a first pair of double edge clocked bi-stable circuits coupled to a first multiplexer, the first pair of double edge clocked bi-stable circuits to provide a first signal;**

**a second pair of double edge clocked bi-stable circuits coupled to a second multiplexer, the second pair of double edge clocked bi-stable circuits supplied by the mutually quadrature phase shifted signals to provide a second signal, wherein the first and the second multiplexers are controlled by a control signal having the same bit-rate as the incoming signal;**

**a third pair of double edge clock bi-stable circuits coupled to a third multiplexer supplied by the first signal;**

**a fourth pair of double edge clock bi-stable circuits coupled to a fourth multiplexer supplied by the second signal; and**

**wherein the first and second pair of double edge clocked bi-stable circuits are supplied by mutually quadrature phase shifted signals respectively to provide the first signal and the second signal, wherein the first and second signals are indicative for a phase difference between the incoming signal and mutually quadrature phase shifted signals. ---**

(2) Cancel claim 2.

(3) In claim 3, line 1 change the following wording:

“A Phase Locked Loop as claimed in claim 2” to

**--- A Phase Locked Loop as claimed in claim 1 ---**

### ***Allowable Subject Matter***

2. The following is a statement of reasons for the indication of allowable subject matter

The present invention a Phase Locked Loop comprising a frequency detector including a balanced quadricorrelator, the balanced quadricorrelator comprising: a first pair of double edge clocked bi-stable circuits coupled to a first multiplexer, the first pair

Art Unit: 2611

of double edge clocked bi-stable circuits to provide a first signal; a second pair of double edge clocked bi-stable circuits coupled to a second multiplexer, the second pair of double edge clocked bi-stable circuits supplied by the mutually quadrature phase shifted signals to provide a second signal, wherein the first and the second multiplexers are controlled by a control signal having the same bit-rate as the incoming signal; a third pair of double edge clock bi-stable circuits coupled to a third multiplexer supplied by the first signal; a fourth pair of double edge clock bi-stable circuits coupled to a fourth multiplexer supplied by the second signal; and wherein the first and second pair of double edge clocked bi-stable circuits are supplied by mutually quadrature phase shifted signals respectively to provide the first signal and the second signal, wherein the first and second signals are indicative for a phase difference between the incoming signal and mutually quadrature phase shifted signals. The closest Prior Art Moser (US Patent Number 6,853,696) shows a similar system which also includes a frequency detector including a first and second pair of bi-stable circuits coupled respectively to a first and second multiplexer and said multiplexers being controlled by quadrature signals having the same bit-rate as the incoming signal. However, Moser fails to disclose use of a balanced quadricorrelator, the use of double edge clocked bi-stable circuits, a third and fourth pair of double edge clocked bi-stable circuits coupled respectively to a third and fourth multiplexer, wherein the first and second signal are indicative for a phase difference between the incoming signal and mutually quadrature phase shifted signals. The distinct features have been added to the independent claim 1, therefore, rendering them allowable.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. PEREZ whose telephone number is (571)270-3231. The examiner can normally be reached on Monday through Friday: 9am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James M Perez/  
Examiner, Art Unit 2611  
8/4/2008  
/Shuwang Liu/  
Supervisory Patent Examiner, Art Unit 2611